SOCIAL SCIENCES

Public Health Reports

VOLUME 59 MARCH 31, 1944 NUMBER 13

IN THIS ISSUE

CONTENTS

Public Health Reports

Vol. 59 • MARCH 31, 1944 • *No. 13*

THE ACTION OF PENICILLIUM EXTRACTS IN EXPERIMENTAL TUBERCULOSIS[1]

By M. I. SMITH, *Chief Pharmacologist*, and E. W. EMMART, *Associate Cytologist*, *United States Public Health Service*

Antibiotic substances derived from various strains of *Penicillium* have been reported against a variety of pathogenic micro-organisms (*1*, *2*, *3*, *4*). Raistrick and coworkers (*5*, *6*) have also reported the isolation of an active antibacterial agent, penicillic acid, from the culture medium of *Penicillium cyclopium*, in addition to pigments of the anthraquinone group, notably emodic acid and hydroxyemodine (*7*). More recently a nondiffusible substance of extraordinarily high antibacterial potency has been isolated from culture media of *Penicillium notatum* by adsorption methods and variously named notatin (*8*), penicillin B (*9*), and penatin (*10*), all of which appear to be similar if not identical in nature. With the exception of Robinson's work reporting negative results with penicillin in mouse tuberculosis (*11*), there appears to have been no report on the possible effect of this group of antibiotic substances against the tubercle bacillus.

METHODS AND SCOPE

The present report concerns the action of some of these antibiotics against the tubercle bacillus both *in vitro* and *in vivo*. The tuberculostatic action *in vitro* was ascertained by determining the minimal concentration that will cause nearly complete inhibition of growth on glycerine bouillon medium. The tests were carried out in triplicate in 50 cc. of culture medium to which penicillin, penatin, and extracts of the culture medium of *P. cyclopium* and *P. notatum*, prepared in this laboratory, were added in various concentrations.

Chemotherapeutic tests were carried out *in vivo* both on the chorioallantoic membranes of the chick embryo and in the guinea pig. The

[1] From the Division of Physiology, National Institute of Health.

chorioallantoic membrane tests were made to ascertain to what extent, if any, these antibiotics could prevent or reduce the extent of tubercle formation on the membrane following implantation of suspensions of tubercle bacilli treated with the drug in question. In these experiments bacillary suspensions were prepared with physiologic saline for the controls, and with definite concentrations of the antibiotics for the treated groups. The volume of the inoculum was uniformly 0.2 cc. and the weight of bacilli 1 mg. At the end of the experimental period of 6 days, the membranes were fixed *in situ*, and the number and size of tubercles noted. In general the technique employed was similar to that previously described (*12*).

In the guinea pig experiments the preparations were administered subcutaneously in suitable doses. Treatment was begun immediately following intraperitoneal inoculation with tubercle bacilli and continued from 2 to 4 weeks. The weight curve, mortality, and extent of tuberculous involvement in the treated animals as compared with the controls were used as an index of the chemotherapeutic efficacy of the substances tested.

A single strain of human tubercle bacilli, A 27, (Henry Phipps Institute) was used in all the experiments.

The preparations tested were:

1. Extracts of culture media of *Penicillium cyclopium* grown on Raulin-Thom medium as suggested by Raistrick and associates (*6*).
2. Extracts of culture media of *Penicillium notatum* similarly grown.
3. Penicillin manufactured by Squibb and Merck and made available by Dr. Chester S. Keefer through contract between the Office of Scientific Research and Development and Massachusetts Memorial Hospital.
4. Penatin which was kindly supplied by Dr. W. Kocholaty, University of Pennsylvania.

The first two antibiotics were prepared as follows: The organisms, *P. cyclopium* and *P. notatum*, which were obtained from Dr. Charles Thom, were grown at a temperature of 24° C. on the synthetic Raulin-Thom medium in 2-liter flasks, each containing 350 cc. of the medium. After 14 to 18 days the contents of six flasks were filtered, the pH adjusted to between 2.5 and 3.0 with dilute HCl and extracted for 2 days with 2 liters of ether in a continuous all-glass extraction apparatus. The ether extract was then concentrated by distillation to about 50 cc. and extracted in a small separatory funnel with several portions of 5 to 10 cc. H_2O and a few drops of dilute NaOH, care being taken not to permit the pH of the extract to go above 8. The extracts were then combined, the pH adjusted to 6.6 to 7.0, the ether drawn off *in vacuo*, and the volume of the yellow to brown extract adjusted to 4 cc. to represent the equivalent of one culture flask. For convenience the potency of these extracts is referred to as ¼ unit per cc.

RESULTS

Tuberculostatic action in vitro.—These experiments, summarized in table 1, show that penicillin in concentrations of from 100 to 3,000 Florey units per 100 cc. of glycerine bouillon had no marked inhibitory effect on growth. Similarly 50 to 1,000 units in Proskauer and Beck medium showed no inhibition of growth. Penatin in concentrations as high as 2 mg. per 100 cc. showed no inhibition of growth of tubercle bacilli. The activity of this preparation, according to Dr. W. Kocholaty, was such as to inhibit the growth of *Staphylococcus aureus* in a concentration of 1:100,000,000 in the presence of dextrose.[2] In our experiments 5-percent dextrose was also added to the glycerine bouillon medium as well as to the inoculum in the *in vivo* tests described below.

TABLE 1.—*Tuberculostatic action of* Penicillium *antibiotics in glycerine bouillon*

Preparation	Concentration, per 100 cc.	
	Good growth	Slight or no growth
Penicillin (Squibb)	3,000 units	
Penicillin (Merck)	1,000 units	
Penatin	2.0 mg.[1]	
Extract *Penicillium cyclopium*	1.0 unit [1]	
Extract *Penicillium notatum*	0.12 unit	0.25 unit.
Do	0.33 unit	1.5 units.
Do	0.5 unit	2.0 units.
Penicillium notatum benzoic acid adsorbate	2.8 units [1]	
Penicillium notatum kaolin adsorbate	4.0 units [1]	

[1] Dextrose added to medium.
[2] For definition of unit, see text and footnote in table 2.

Of the extracts of the culture media of *Penicillium cyclopium* and *P. notatum* prepared in this laboratory the former gave no inhibition while the latter gave good inhibition of growth of tubercle bacilli in glycerine bouillon in concentrations of ¼ to 2 units per 100 cc. These preparations exhibited considerable variation in activity.

Chemotherapeutic effectiveness of Penicillium *extracts on the chorioallantoic membrane.*—Four experiments were carried out with penicillin, one with penatin, and four with extracts of the culture media from *Penicillium notatum.* These experiments are summarized in table 2. In the experiments with penicillin the drug was administered in 100, 400, 722, and 800 Florey units. Penatin was administered in doses of 0.1 mg. per membrane. The extracts prepared in this laboratory and used in experiments 6, 7, 8, and 9 were administered in units as indicated in table 2, the unit having been designated arbitrarily as the equivalent of one culture flask. In experiments 6, 8, and 9 an aqueous solution of the ether extract was used, while in experiment 7 an aqueous solution of a salicylic acid adsorbate eluted

[1] Personal communication.

with acetone was employed. From 13 to 24 eggs were used for each experiment. The controls were inoculated with the saline suspension of 1 mg. of bacilli; the treated animals received the same amount of bacilli with the drug as indicated.

TABLE 2.—*Effect of* Penicillium *antibiotics on tubercle development on the chorio-allantoic membrane*

C=Control T=Treated

Experiment number	Preparation	Dose in units [1]	Number inoculated		Number survived		Number with lesions		Average number of tubercles per membrane	
			C	T	C	T	C	T	C	T
1	Penicillin (Merck)	100	18	18	11	13	10	12		
2	Penicillin (Squibb)	400	18	18	10	11	10	11		
3	do	722	17	13	15	2	13	2	6.6	2.0
4	do	800	18	18	15	3	15	3	12.0	1.0
5	Penatin (Kocholaty)	0.1 mg	18	24	14	15	14	14	11.5	4.1
6	Extract *Penicillium notatum*	0.05	18	18	13	9	12	9		
7	*Penicillium notatum* salicylic acid adsorbate.	0.15	18	22	12	17	12	17	12.1	4.2
8	Extract *Penicillium notatum*	0.20	18	24	10	14	10	14	37.8	12.0
9	do	0.40	24	21	19	16	19	14		

[1] Penicillin in Florey units; the unit of the extracts is arbitrarily defined as the equivalent of one culture flask of 350 cc. medium.

The first two experiments given in table 2 show that up to 400 units, penicillin had no inhibiting action. At 722 and 800 units the drug was toxic to the chick embryo, but in the few surviving membranes the average number of tubercles per membrane and their size were reduced. In experiment 5, in which 0.1 mg. of penatin was administered, the number of tubercles per membrane and the size of the tubercles were smaller. In the experiments with 0.15, 0.2, and 0.4 units of *Penicillium notatum* extracts prepared in this laboratory, the average number of tubercles per membrane was reduced and the tubercles were smaller in size. The incidence of infection was not decreased in any case.

Chemotherapeutic effectiveness in experimental guinea pig tuberculosis.—In this there were two series of experiments. In the first, 30 guinea pigs of about 300 to 400 gm. were inoculated with 0.5 mg. of A 27 tubercle bacilli intraperitoneally, 10 of which were used as controls and 20, which were divided into two equal groups, were treated daily with ¼ unit of the aqueous solution of the ether extract of *Penicillium notatum* and *Penicillium cyclopium* culture media, respectively. The treatment was continued for a month and the experiment was terminated after 58 days. At this time two died in each of the *cyclopium* and control groups, while all of the *notatum* group survived. All the animals were then killed, and the extent of tuberculous involvement noted and rated on the basis of 0 to 4 according to the amount of tuberculosis present in each of the following organs: omentum and glands, spleen, liver, peritoneum and kidneys, and lungs. The spleens

were also weighed. The results of this experiment, shown in table 3, indicate that treatment with the extract of *Penicillium notatum* had a slightly favorable effect as regards survival, weight gain, extent of tuberculous involvement, and spleen weight. Treatment with extracts of *Penicillium cyclopium* appeared to have no beneficial effect. Macroscopic tuberculosis was present in all animals, the treated as well as the controls.

TABLE 3.—*Effect of treatment with extracts of* Penicillium *on experimental tuberculosis in guinea pigs*

Group	Mortality percent	Average gain in weight (grams)	Average tuberculosis index	Average spleen weight (grams)
Controls	20	83	7.0	4.0
Penicillium cyclopium	20	95	7.1	3.6
Penicillium notatum	0	108	5.5	3.0

In the second series of experiments there were 16 controls and 13 treated animals. The latter were treated once daily with 500 units penicillin (Merck or Squibb) for the first 4 days followed by 200 units daily for the next 12 days. The dose was reduced because four animals died of drug toxicity during the first few days of treatment. Inadequate supply of the material necessitated discontinuance of treatment after 16 days. All the animals in this series weighed from 275 to 325 grams at the time of inoculation when they received an intraperitoneal injection of 1 mg. of tubercle bacilli of the human strain A 27. One of the controls died within a month of inoculation. At 45 days the experiment was terminated. At this time the 15 controls and the 9 surviving treated animals were killed and the extent of tuberculous involvement noted as in the preceding series. Analysis of the data indicated an average tuberculosis index for the controls of 9.8, as against 9.9 for the treated animals. Clearly no beneficial effect whatever could be seen from the penicillin treatment under the experimental conditions outlined. However, the short period of treatment and the rapid elimination of penicillin from the body (*13*) leave the possibility open that more intensive treatment with this substance might yield more favorable results. In view of the present wholly negative results this does not seem very probable.

DISCUSSION

The present experiments indicate that penicillin has no effect on the growth of tubercle bacilli in culture media, and little, if any, effect on the production of tubercles on the chick membrane. In two of the experiments in which large doses of penicillin were introduced with the inoculum on the chick membrane, the size and num-

ber of the tubercles appear to have been reduced, but the high toxicity of the drug rendered the results inconclusive. Similarly, penicillin given to guinea pigs for a limited period did not hinder the course of the disease.

Only a limited amount of penatin was available for our experiments. Although at the concentrations used it was less toxic to the chick membrane than penicillin, the effect in inhibiting tubercle development was slight. It retarded tubercle development on the membrane but did not prevent it.

Lastly, the aqueous solutions of the ether extracts of the medium of *Penicillium notatum* cultures were found to inhibit the growth of tubercle bacilli *in vitro*. These preparations when added to the inoculum and planted on the chorio-allantoic membrane of the chick embryo were nontoxic and appeared to reduce the size and average number of tubercles per membrane. However, the incidence of infection was not affected by doses up to 0.2 units and only slightly reduced at a dosage of 0.4 units.

In the experiment in which 10 guinea pigs received daily ¼ units of the extract of the culture medium *P. notatum* for 1 month, slight inhibition of the progress of the disease was noted at the end of the experimental period of 8 weeks. The slight activity against the tubercle bacillus which was obtained from these extracts is probably to be ascribed to quinones which, in the light of the work of Raistrick and associates (*7*), are almost certainly present. It is to be noted that the Raulin-Thom culture medium used in the cultivation of *P. notatum* is not that used in the preparation of penicillin and penatin. This, as well as differences in preparation, may account in part for the chemotherapeutic differences obtained. At best, the chemotherapeutic activity of these preparations was slight compared with that of some of the sulfones, which have been under investigation in this laboratory (*14*).

SUMMARY AND CONCLUSIONS

Several *Penicillium* antibiotics have been examined for their bacteriostatic action against the tubercle bacillus *in vitro*, for their inhibiting action of tubercle formation on the chorio-allantoic membrane of the chick embryo, and for their chemotherapeutic effectiveness in experimental guinea pig tuberculosis.

Penicillin and penatin were ineffective in inhibiting the growth of the tubercle bacillus *in vitro*. Aqueous solutions of ether extracts of Raulin-Thom culture media of *Penicillium notatum* exhibited *in vitro* marked activity at certain concentrations, while similar extracts of *Penicillium cyclopium* showed none.

All preparations tested appeared to have some activity in reducing

the extent of tubercle formation on the chorio-allantoic membrane without effecting a reduction in the incidence of infection.

Penicillin (Florey) and extracts of culture media of *Penicillium cyclopium* exhibited no effect on experimental tuberculosis in guinea pigs. A slightly favorable effect was obtained with extracts of Raulin-Thom culture media of *Penicillium notatum*.

REFERENCES

(1) Fleming, A.: On the antibacterial action of culture of *Penicillium* with special reference to their use in the isolation of *B. influenzae*. Brit. J. Exp. Path., **10**: 226 (1929).
(2) Reid, R. D.: Antibacterial action of *Pencillium notatum*. J. Bact., **29**: 215 (1935).
(3) Chain, E., Florey, H. W., Gardner, A. D., Heatley, H. G., Jennings, M. A., Orr-Hughing, J., and Sanders, A. G.: Penicillin as a chemotherapeutic agent. Lancet, **239**: 226 (1940).
(4) Florey, H. W., and Jennings, M. A.: Some biological properties of highly purified penicillin. Brit. J. Exp. Path., **23**: 120 (1942).
(5) Birkenshaw, J. H., Oxford, A. E., and Raistrick, H.: Penicillic acid from *Penicillium puberulum* and *cyclopium*. Biochem. J., **30**: 394 (1936).
(6) Oxford, A. E., Raistrick, H., and Smith, G.: Antibacterial substances from moulds. II. Penicillic acid a metabolic product of *Penicillium puberulum* Bainer and *Penicillium cyclopium* Westling. Chem. & Ind., **61**: 22 (1942).
(7) Anslow, W. K., Breen, J., and Raistrick, H.: Emodine in *Penicillium cyclopium* Westling. Biochem. J., **34**: 159 (1940).
(8) Michaelis, R., Sykes, G., Standfast, A. S. B., Raistrick, H., Coulthard, C. E., Short, W. S., Birkenshaw, G. H., and Skrimshire, G. E. H.: Notatin: an anti-bacterial Glucose aerodehydrogenase from *Penicillium notatum* Westling. Nature, **150**: 634 (1942).
(9) Roberts, E. C., Cain, C. K., Muir, R. D., Reithel, F. J., Gaby, W. L., Van Bruggen, J. T., Homan, D. M., Katzman, P. A., Jones, L. R., and Doisy, E. A.: Penicillin B, an anti-bacterial substance from *Penicillium notatum*. J. Biol. Chem., **147**: 47 (1943).
(10) Kocholaty, W.: Purification and properties of penatin. Arch. Biochem., **2**: 73 (1943); Science, **97**: 186 (1943).
(11) Robinson, H. J.: Toxicity and efficacy of penicillin. J. Pharm. & Exp. Therap., **77**: 70 (1943).
(12) Emmart, E. W., and Smith, M. I.: The growth and effects of the tubercle bacillus on the chorio-allantoic membrane of the chick embryo. Pub. Health Rep., **56**: 1277 (1941).
(13) Rammelcamp, C. H., and Keefer, C. S.: The absorption, excretion and distribution of penicillin. J. Clin. Invest., **22**: 425 (1943).
(14) Smith, M. I., Emmart, E. W., and Stohlman, E. F.: The action of some derivatives of 4–4′ diaminodiphenylsulfone in experimental tuberculosis. Am. Rev. Tuber., **48**: 32 (1943).

ENTOMOLOGICAL PHASES OF THE RECENT DENGUE EPIDEMIC IN HONOLULU [1]

By Robert L. Usinger, *Passed Assistant Sanitarian (R), United States Public Health Service*

INTRODUCTION

Mosquitoes are recent immigrants to Hawaii. Although numbering countless millions, only three species are represented. The night

[1] Presented in the "Symposium on War and Post-War Tropical Medicine", at the annual meeting of the American Society of Tropical Medicine, Cincinnati, Ohio, November 17, 1943.

572609°—44——2

mosquito, *Culex quinquefasciatus* Say, arrived first in the mosquito-free Hawaiian paradise aboard the *Wellington* from Mexico in 1826. There being no native name for mosquitoes, Hawaiian kanakas called them singing flies, only later applying a new name, makika, adapted from our word mosquito. The day mosquitoes, *Aedes aegypti* (Linn.) and *Aedes albopictus* (Skuse), arrived somewhat later. *Aegypti* was widespread in Hawaii when Perkins (*3*) started his collection for the Fauna Hawaiiensis in 1892, whereas *albopictus* "did not come to notice during the earlier days of [his] collecting" but was "very numerous and conspicuous" by 1902.

Fortunately no *Anopheles* mosquitoes have become established in Hawaii, the malaria vectors having stopped, as did most snakes, land mammals, and many forms of aquatic life, at the line which separates the continental islands of Melanesia and the Orient from the truly oceanic islands of Polynesia and Micronesia. Only in the New Hebrides have anophelines crossed this line, but this single crossing suggests that other Pacific islands would be suitable for colonization and fully justifies the efforts being made to exclude *Anopheles* from Hawaii by spraying incoming Army, Navy, and civilian planes.

HISTORY OF MOSQUITO-BORNE DISEASES IN HAWAII

Mosquito-borne diseases have not played an important part in the health history of Hawaii. Extreme isolation, rigid quarantine, and a limited mosquito fauna are responsible for this happy situation. In spite of this combination of circumstances, dengue broke out in Honolulu in 1903. Assistant Surgeon G. W. Wilson of the United States Public Health Service (*12*) reported that the steamer *Doric*, 23 days out of Hong Kong where an epidemic was in progress, arrived on September 11, 1902, with 12 cases of dengue. The first local cases in Honolulu were not recognized until January 1, 1903, but doubtful cases of measles and scarlet fever had been treated in previous weeks. The epidemic spread to all the islands during the following 3 months, reaching its peak in April and May. By December 1, 1903, it had subsided, only an occasional case being reported. Dr. Wilson estimated that 30,000 cases occurred, although most of these were not officially reported.

On October 30, 1911, the *Hong Kong Maru* arrived from Mexico with yellow fever aboard and a local watchman who went aboard the ship came down with the disease at Kalihi Camp on October 30. That there were no secondary cases is doubtless due to the prompt action of health officers. The camp was depopulated, practically denuded, and quarantined, and a general mosquito control program was inaugurated under Passed Assistant Surgeons D. H. Currie and G. W. McCoy and Surgeon Rupert Blue of the United States Public Health Service.

This campaign is still vivid in the minds of older residents because of the furor over eradication of banana plants as mosquito breeding places. Jack Kalakiela will go down in history as "Banana Jack" for his part in the affair which finally resulted in payment by the Territory of Hawaii of over $30,000 in damages to irate citizens.

In 1912, dengue again broke out in Honolulu. Older residents and doctors state that most of the population had dengue but reports are fragmentary, only 108 cases having been reported officially in 1912 when the epidemic must have been at its height. Twenty cases were reported in 1913, 11 in 1914, and 7 in 1915.

The present dengue outbreak is of doubtful origin but the first two cases were reported on July 24, 1943, one in the Waikiki district and one in Nuuanu Valley. One story relates that commercial fliers arrived from the South Pacific early in July and occupied an apartment at a Waikiki rooming house. The maids at this house later came down with what was subsequently suspected of being dengue. By August 8, Waikiki had become such a focus of infection that it was restricted to military personnel. Most of the early cases apparently originated in Waikiki but by September 13 larvicidal work and thorough spraying of adults had practically eliminated *Aedes* mosquitoes from this district so the restriction was lifted. Cases were no longer originating there but were occurring in all other parts of the city. Late in September another major focus developed in the Kakaako district near the center of the city. This grew out of the negligence of a prominent laundry in following up the larvicidal work with regular adult spraying. Only after 70 employees were absent on a single day was action taken. By this time a major focus had developed and cases were reported for the city as a whole at the rate of 100 per week where 10 per week had been the previous average.[2] Three nurses working in the linen department of a maternity hospital served by the laundry came down with dengue, presumably from infected mosquitos carried in bundles, and many other cases, both civilian and military, were traced to this spot.

The disease is fairly typical dengue but the characteristic depressed feeling and the breakbone sensation are less severe than in some epidemics. Blood work was available in only a few cases, the reports showing a mild leucopenia with the white count averaging 4,000. Fifty percent of the cases showed a rash and about half showed the saddleback temperature curve but epidemiologists were so rushed and nurses so busy distributing bed nets to new patients that all such information was gathered on a single visit and hence was incomplete.

[2] Since this paper was presented the average number of cases per week has decreased from the peak of 160 to fewer than 25. The total number of cases as of December 31, 1943, has reached 1,340.

Culex quinquefasciatus Say, although not involved in the dengue picture, cannot simply be relegated to the status of a pest mosquito in Hawaii. With filariasis so common in the South Pacific and with the increase of travel under war conditions, *Culex* control is an important precautionary health measure. As elsewhere, *Culex quinquefasciatus* is the foul water breeder of Hawaii. It is almost invariably the species found in street gutter catch basins and in ground pools in air raid shelters. It breeds in great numbers in irrigation water in sugar-cane fields. It ranges much higher than *Aedes* mosquitoes, Swezey and Williams having found it at 5,000 feet on the Island of Hawaii. Captain Sherman of the United States Army found it commonly and almost exclusively in brackish water wells on Ewa Coral Plain, only a very few *albopictus* larvae being mixed with the *Culex*. Mosquitoes captured in a survey of interisland freight and passenger planes proved to be *Culex* which enter the planes at night while mechanics are working.

Aedes aegypti (Linn.) and *albopictus* (Skuse) have been incriminated in various parts of the world as vectors of yellow fever, dengue, equine encephalomyelitis, bird malaria, hemogregarines of geckos, and filariasis of man and dogs.

Systematics.—Aedes aegypti (Linn.) belongs to an African section of the subgenus *Stegomyia*, characterized by a pair of crescent-shaped patches of white scales on the mesonotum, a long vertical arm near the bases of the paraprocts, and a terminal spine on the style of the male terminalia. *Albopictus* belongs to an Oriental section, the so-called "*scutellaris* group," of *Stegomyia* in which the mesonotum has a conspicuous median line, the paraprocts lack the vertical arm near the base, and the style has a spine more or less removed from the tip (*1*).

Although very different in appearance, Toumanoff (*10*, *11*) crossed *albopictus* females with *aegypti* males, the progeny all resembling *albopictus*. The reciprocal cross was less successful, only one aegypti-like specimen coming through. These crosses were successful in Indochina but attempts to cross a Calcutta strain of *albopictus* with Indochinese *aegytpi* failed. Attempts to cross the two species in Manila (*8*) also failed.

Aedes aegypti (Linn.) has spread throughout the tropics and most of the subtropics. Because of its domestic habits and its preference for urban environments, it is the dominant species in cities far away from its original African home. *Albopictus*, on the other hand, is confined to the Oriental region with extensions to Madagascar on the southwest and New Guinea and North Australia to the southeast (*1*). The dis-

continuous eastward extension of this species to Hawaii is remarkable and doubtless came about through trans-Pacific shipping.

From a survey of distributional records and a comparison of specimens from various Pacific islands, it appeared that two species had been confused under the name *albopictus* in dengue literature. After an extensive study of material in the National Museum, Dr. Alan Stone confirmed this. He found that his *albopictus* specimens were all from the Oriental region including the Philippine Islands and the Hawaiian Islands. Other Pacific islands to the south and west (New Hebrides, Samoa, Tonga, Fiji, and Guam) had various forms of the closely related *Aedes* (*Stegomyia*) *scutellaris* (Walker). Both *scutellaris* and *albopictus* have been reported from New Guinea and the Philippines. *Scutellaris* resembles *albopictus* in possessing a central silvery stripe on the mesonotum but differs (Stone, *in litt.*) in color pattern and in form of the male terminalia as follows:

Scutellaris: White scales of thoracic pleura arranged in two wavy, parallel lines. Basistyle long and narrow; subterminal spine of dististyle placed some distance from apex, long and at right angles to the dististyle; margin of ninth tergite nearly straight between the lateral lobes. The different subspecies differ in the shape of the basal lobe of the basistyle.

Albopictus: White scales of thoracic pleura arranged in irregular patches. Basistyle short, and stout basally, subtriangular; spine of dististyle placed close to apex, shorter, and more in line with dististyle; ninth tergite with a prominent projection in the middle.

Habits.—Since the time of Carlos Finlay and Walter Reed, a vast amount of detailed information has been accumulated on the life history, habits, and ecologic limits of *aegypti*. Unfortunately, knowledge of the related day mosquitoes of the Australasian and Oriental regions has not kept pace. *Scutellaris* and *albopictus* have simply been compared in a general way to *aegypti* and at least *albopictus* has been described as "similar" to *aegypti* by Robertson and Hu (*4*) in Shanghai. They called it the "tiger mosquito" and reported that it resembles *aegypti* so closely as to be considered identical from the standpoint of control. Actually Hawaiian *albopictus* resembles *aegypti* in the following points:

(1) *Urban breeding habits.*—In Honolulu, *aegypti* was found to outnumber *albopictus* 2 to 1 in 1913, the two species were equal in 1911, and *albopictus* was dominant 4 to 1 in 1912, and up to 12 to 1 in 1914. The ratio of 12 to 1 continued in 1915. In 1926, a survey showed that *albopictus* completely dominated the picture, 42.56 percent as compared with 0.34 percent *aegypti*. During the present epidemic, 85 percent of the day mosquitoes were found to be *albopictus*, only 15 percent being *aegypti*. *Albopictus* was found breeding in town in ant cups, flower pots, tin cans, bottles, a paper box, jars, tires, tanks, and in water plants.

(2) *Day biting.*—A day and night spent up on Mt. Tantalus at 1,700 feet elevation where *albopictus* occurred exclusively and in great numbers proved that this species is a persistent day biter but does not bite at night.

(3) *Egg laying.*—Eggs were most commonly observed at or above the water's edge but specimens of *albopictus* in captivity showed a greater tendency than *aegypti* to oviposit on the surface of the water.

(4) *Short flight range.*—Senior-White (*6*) records a short flight range for *albopictus* in India. In the Hawaiian Islands wind trap collections taken by Sakimura at Kunia, Oahu, during the last 3 weeks of September and the first week in October 1943, showed a total of 62 mosquitoes, all of which were *Culex*, no *Aedes* having ventured forth where the wind could pick them up and blow them into traps.

Albopictus also resembles *aegypti* in (5) its silent flight; (6) macroscopic larval appearance and habits, and (7) preference for human blood, Toumanoff (*9*) having found human blood by means of precipitin tests even in mosquitoes which were resting in cattle stables.

Differences between the two species are slight but very important. *Albopictus* was found to have a life cycle scarcely longer (18 days) than *aegypti* (17 days) in the summer season in Shanghai but *albopictus* had a shorter life cycle (24 days) than *aegypti* (27 days) in the winter (*4*). In India, Sen (*5*) found that *albopictus* will bite at a lower temperature (13° C.) than *aegypti* (15° C.). This greater tolerance for cold weather enables *albopictus* to range upward to approximately 2,000 feet in the mountains of the Hawaiian Islands. It is a severe pest throughout the lower forest area, breeding in tree holes and in water at the bases of leaves of plants. The author has found it commonly at 1,700 feet but has found no records of day mosquitoes above the 2,000-foot level. *Aegypti* was once reported from 1,500 feet in the Waianae Mountains (Grimshaw, 1892) but the record seems doubtful considering the present distribution of this species. Since *albopictus* is so perfectly adapted to life in the extensive lower forest zone it may be considered a practical impossibility to eradicate the species from the Hawaiian Islands.

To summarize, *albopictus* is actually dominant over *aegypti* in the city of Honolulu and also thrives beyond the range of *aegypti* in the forest area up to 2,000 feet. Strangely enough, the dominant species where both occur in the Orient appears to be *aegypti* (*6*) so it may be assumed that large Oriental cities on the coastal plain are particularly suitable for *aegypti*. Honolulu is situated at the foot of the Koolau Mountain range with ridges actually extending down into the city. Thus *albopictus*, although breeding in the city, is actually quite close to the mountain forests and is particularly favored in the better residential districts at the moist heads of Nuuanu and Manoa Valleys.

Control.—Control of *Aedes* mosquitoes in Hawaii comprises routine inspection and correction of all breeding places throughout the city, each premise being covered every 10 days. In addition, special educa-

tional activities are conducted, designed to enlist the cooperative support of the householder. This is a basic but rather slow procedure which increases in effectiveness as inspectors become more experienced and as the cumulative effect of clean-up of many premises begins to show results.

Meanwhile, under epidemic conditions, thorough spraying of adults and the spraying inside and out of all premises in and around a focus of several dengue cases became necessary to prevent an explosion of cases. Where foliage had to be sprayed, a pyrethrum and oil spray was used at the rate of 3 parts per 100 of water with Vatsol as an emulsifying agent. Commercial fly spray was used inside of houses.

MOSQUITOES IN RELATION TO DENGUE

The relation of *Aedes* mosquitoes to the present epidemic is rather unique. First, the limited value of a city-wide index as an indication of possible dengue epidemics is evident. Mosquito breeding is very low in certain districts of Honolulu. The general breeding index of 1.7 percent for the first 2 weeks' inspection period is, of course, unusually low because of inexperienced inspectors but a spot survey of various districts throughout the city indicates that it was less than 10 percent during the month of September. This was near the end of the dry season so more breeding places may be expected with the onset of winter rains. Yearly rainfall averages within the city limits range from less than 25 inches to over 100 inches. The breeding index was found to be 83 percent in a spot survey of a very wet district at the head of Nuuanu Valley whereas it was less than 4 percent in a dry and relatively clean area at Waikiki. Such conspicuous variations are of course concealed by a city-wide index.

Curiously, the dengue cases occurred in nearly inverse proportion to the general mosquito breeding index. This apparent anomaly is especially noticeable in the presence of better homes with large gardens and extensive grounds in the wet, mosquito-ridden heads of the valleys, in contrast to small unscreened houses in densely populated areas in the drier parts of the city. Dengue died out without secondary cases under the former conditions in Nuuanu Valley whereas it flourished under congested conditions in the Kakaako district. The correlation of dengue cases with density of human population rather than with density of mosquitoes is due to the short flight range of the mosquitoes, to the presence of more people to be infected in a populous area, and to the dilution factor in mosquito bites when people are few and mosquitoes are present by the thousands.

Dengue epidemics may be eliminated in three ways. In temperate regions the first frost kills all adults outside and stops the epidemic.

In tropical oceanic islands most of the population contracts dengue during an epidemic and the disease gradually disappears, probably because of individual immunity. Finally, dengue may be eliminated by reducing mosquitoes below the threshold of sanitary importance. Since frost does not occur in Honolulu and since it is imperative that such a general involvement of the whole population as in 1903 and 1912 be avoided for military reasons, the third and most difficult course must be pursued in the present epidemic. Spontaneous elimination of dengue depends upon a general lowering of mosquito breeding below the level of sanitary importance. This is the point beyond which mosquitoes are so scarce that, with their short flight range, they do not reach dengue cases during the short period of infectivity of the disease.

At the moment it would appear that prompt reporting and isolation of patients and emergency spraying of local foci to kill infected adult mosquitoes should hold the epidemic at its present relatively low level. Meanwhile, the basic inspectional and correctional program with coincident education of the public should gradually increase in effectiveness so that dengue may possibly be eliminated from Honolulu without having to subject the entire population to the painful and costly process of developing a temporary immunity to the disease.

REFERENCES

(1) Edwards, F. W.: Diptera. Fam. Culicidae. Genera Insectorum, 194me Fasc., 1932.

(2) Grimshaw, P. H.: Diptera. *In* Fauna Hawaiiensis, Vol. III, Part 6. University Press, Cambridge, England, 1913.

(3) Perkins, R. C. L.: Introduction. Fauna Hawaiiensis. Vol. I. Part 6, p. clxxxi. University Press, Cambridge, England, 1913.

(4) Robertson, R. C., and Hu. Stephen M. K.: The tiger mosquito in Shanghai. China J., 23: 299–306 (1935).

(5) Sen, S. K.: Experiments on the transmission of Rinderpest by means of insects. Mem. Dept. Agric. India, Ent. Ser., 9: 59–185 (1927).

(6) Senior-White, R.: Three years' mosquito control work in Calcutta. Bull. Ent. Res., 25: 551–596 (1934).

(7) Siler, J. F., Hall, Milton W., and Hitchens, A. P.: Dengue, its history, epidemiology, mechanism of transmission, etiology, clinical manifestations, immunity and prevention. Philippine J. Sci., 29: 1–304 (1926).

(8) Simmons, J. S., St. John, J. H., and Reynolds, F. H. K.: Transmission of dengue fever by *Aedes albopictus* Skuse. Philippine J. Sci., 41: 215–229 (1930).

(9) Toumanoff, C.: L'épreuve des precipitines appliquée à l'étude des habitudes trophiques chez quelques Culicines d'Extreme-Orient. Bull. Soc. Path. Exot., 28: 943–948 (1935).

(10) ————: Essais préliminaries d'intercroisement de St. albopicta Skuse avec St. argentea Poiret s. fasciata Théob. Bull. Soc. Méd.-Chir: Indochine, 15: 964–970 (1937).

(11) ————: Les races geographiques de St. fasciata et St. albopicta et leur intercroisement. Bull. Soc. Path. Exot., 32: 505–509 (1939).

(12) Wilson, G. W.: Epidemic of dengue in the Territory of Hawaii during 1903. Pub. Health Rep., 19: 67–70 (1904).

THE EFFECT OF A SYNTHETIC MARIHUANA-LIKE COMPOUND ON MUSICAL TALENT AS MEASURED BY THE SEASHORE TEST

By C. KNIGHT ALDRICH, *Assistant Surgeon, United States Public Health Service*

Musicians, particularly members of dance orchestras, are reputed to use marihuana for the purpose of enhancing their musical ability. Piel (*1*), in Life Magazine, reports that in the state of marihuana intoxication "the swing musician ascends to new peaks of virtuosity." Medical writers, however, are inclined to question this belief, and Walton (*2*) states that "there is very little probability that an individual's performance is in any degree improved over that of his best capabilities. As judged by objectively critical means, the standards of performance are no doubt lowered." In an endeavor to discover the cause of the common misapprehension, he says: "There is an increased sensitivity to sound and a keener appreciation of rhythm and timing," but he feels that "these phenomena, as judged by objective criteria, probably do not exist except during the early phases of the drug's effects." He suggests that the release of inhibitions by marihuana may result in bringing latent talents to the surface or in evoking a more intense emotional performance. He also recognizes, with Bromberg (*3*) and others, that a subject's evaluation of his own performance is enhanced.

PROCEDURE

The synthesis of the pyra-hexyl compound (1-hydroxy-3-n-hexyl-6,-6,9-trimethyl-7,8,9,10-tetrahydro-6-dibenzopyran) by Professor Adams (*4*) has facilitated the study of marihuana by furnishing a stable drug of uniform potency and consistent effect. Experienced marihuana users report that the psychological effects of this compound are qualitatively identical with those of marihuana. The present experiment was set up to study the effect of this compound on performance as measured by the Seashore tests of musical talents (*5*), in order to determine objectively whether or not marihuana affects musical ability.

The Seashore tests were used because they seemed to offer the most carefully standardized tests available of musical capability. Although they have been criticized for their low reliability and their value in individual diagnosis has been questioned, for group work they are, as Mursell (*6*) says, "outstandingly the most important battery of tests in the field of music."

The six tests are played on phonograph records. The first consists of 50 pairs of notes of progressively diminishing degree of difference in pitch; the subject indicates whether he considers the second note of the pair to be higher or lower than the first. Three other tests are similarly constructed, with differences in loudness, time, and timbre.

572609°—44——3

Two consist of 30 double series of notes, in one of which the subject decides whether two rhythm patterns are the same or different, and in the last he identifies by number one note which is changed in the second of two otherwise similar tone patterns.

Twelve healthy white male patients volunteered for the experiment. All were serving prison sentences for violation of the Marihuana Tax Act. One was 47 years of age; the ages of the others varied between 23 and 36 years. They had used marihuana from 3 to 18 years with an average of 9½ years. Of the 12 subjects, 2 were professional musicians and 2 had musical ambitions. Each patient was given the test three times, at intervals of 1 week; twice without any drug, and the third trial 4½ hours after ingestion of 60 mg. of pyra-hexyl compound. This quantity and time were found to produce a "kick" comparable to a satisfying amount of marihuana in most cases, although individual variations were noted.

The average of the results, summarized in table 1, shows improvement in all tests on the second trial and a return to approximately the original level under the influence of pyra-hexyl compound. One exception is seen in the case of rhythm in which the change between the second and third trials is negligible. In general the pyra-hexyl compound seems simply to have obliterated the gain due to practice.

TABLE 1

	Pitch (50)	Loudness (50)	Rhythm (30)	Time (50)	Timbre (50)	Tonal memory (30)
First trial	35.9	39.2	23.4	34.7	41.8	21.2
Second trial	37.2	40.5	24.1	36.7	43.1	23.3
After pyra-hexyl	35.3	39.8	24.2	33.9	41.9	21.8

Average number correct: 12 patients.

The Seashore test measures only sensory musical capacity and leaves out of account factors such as motor speed and coordination, release of inhibitions and fatigability, which could conceivably influence the playing of present-day music. The subjective reports, however, emphasize the extent of the self-deception brought out by marihuana. Eight of the patients, when asked if they noticed any differences in their own performances, felt sure that they had improved with marihuana; 3 felt that they remained the same, and 1 "couldn't say." Actually, 9 out of 12 subjects achieved lower scores on the third than on the second trials.

Subject D, a professional saxophone player, said after the third trial, "I am convinced I was better * * * I'm sure the medicine helped; I know it does on my horn as I hear the notes more distinctly." He stated that the medicine made him " 'high' but not quite to the

peak—about three-fourths I'd say." His scores, indicating in general a poorer performance with the drug, are shown in table 2.

TABLE 2

	Pitch (50)	Loudness (50)	Rhythm (30)	Time (50)	Timbre (50)	Tonal memory (30)
First trial	33	43	26	39	44	27
Second trial	40	47	24	39	47	29
After pyra-hexyl	33	46	26	35	44	27

Patient "D" number correct.

SUMMARY OF RESULTS

No improvement was observed in the musical capability, as tested by the Seashore measures of musical talents, of 12 former users of marihuana after ingestion of satisfying amounts of pyra-hexyl compound, a synthetic, marihuana-like substance.

Although 9 out of 12 subjects achieved poorer scores after using the drug than on the previous trial, 8 out of 12 expressed the opinion that their scores had improved, and none recognized a loss in efficiency.

CONCLUSION

Pyra-hexyl compound, a marihuana-like synthetic, appears to improve an individual's subjective impression of his own musical ability rather than the ability per se as measured by the Seashore test.

REFERENCES

(1) Piel, Gerard: Narcotics. Life Magazine, 15 (3): 15–82 (July 19, 1943).
(2) Walton, Robert P.: Marihuana, America's New Drug Problem. Lippincott, Philadelphia, 1938.
(3) Bromberg, Walter: Marihuana, a psychiatric study. J. Am. Med. Assoc., 113: 4 (1939).
(4) Adams, R.: Marihuana (Harvey Lecture). Bull. N. Y. Acad. Med., 18: 1705 (1942).
(5) Seashore, Carl E.: Psychology of Music. McGraw-Hill, New York, 1938.
(6) Mursell, James L.: Psychology of Music. Norton, New York, 1937.

DEATHS DURING WEEK ENDED MARCH 18, 1944

[From the Weekly Mortality Index, issued by the Bureau of the Census, Department of Commerce]

	Week ended Mar. 18, 1944	Corresponding week, 1943
Data for 93 large cities of the United States:		
Total deaths	9,537	9,949
Average for 3 prior years	9,389	
Total deaths, first 11 weeks of year	113,209	112,524
Deaths under 1 year of age	678	711
Average for 3 prior years	614	
Deaths under 1 year of age, first 11 weeks of year	6,984	8,016
Data from industrial insurance companies:		
Policies in force	66,373,891	65,444,262
Number of death claims	13,891	13,266
Death claims per 1,000 policies in force, annual rate	10.9	10.6
Death claims per 1,000 policies, first 11 weeks of year, annual rate	11.5	10.7

PREVALENCE OF DISEASE

No health department, State or local, can effectively prevent or control disease without knowledge of when, where, and under what conditions cases are occurring

UNITED STATES

REPORTS FROM STATES FOR WEEK ENDED MARCH 25, 1944

Summary

Following a decline for 2 successive weeks, the incidence of meningoccus meningitis increased during the current week. A total of 550 cases was reported, as compared with 497 last week. For the third consecutive week, however, the incidence is below the comparable figure for last year; but the cumulative total to date is 6,637, as compared with 5,231 for the same period last year and a 5-year median (1939–43) of 638.

Sixteen States reporting currently more than 10 cases each (last week's figures in parentheses) are as follows: *Increases*—New York 56 (55), New Jersey 20 (15), Ohio 37 (29), Illinois 44 (25), Minnesota 11 (7), Missouri 27 (26), Virginia 37 (24), North Carolina 13 (11), Georgia 11 (6), Florida 15 (7), Tennessee 33 (11), California 47 (35); *decreases*—Massachusetts 11 (25), Pennsylvania 27 (39), Texas 11 (20); *no change*—Michigan 35 (35).

As compared with last week, decreased incidence was recorded for measles and scarlet fever. The totals reported (32,271 cases of measles and 7,356 of scarlet fever) are, however, 32 and 72 percent above the respective 5-year medians, and the cumulative figures for the year to date (272,325 and 69,087) are 49 and 43 percent above the respective medians for the corresponding periods of the past 5 years.

Current figures for diphtheria, influenza, poliomyelitis, and whooping cough are below those for last week, while the reported cases of smallpox (8) are the same for the 2 weeks. A total of 76 cases of typhoid fever was reported, as compared with 70 last week. The cumulative figure to date for each of these six diseases is below the corresponding 5-year medians.

Cumulative totals of other diseases included in the following table (last week's figures in parentheses) are as follows: Anthrax 11 (19), dysentery, all forms, 3,414 (3,303), encephalitis, infectious, 126 (127), leprosy 8 (5), Rocky Mountain spotted fever 2 (3), tularemia 125 (205), endemic typhus fever 475 (597).

A total of 9,605 deaths was recorded in 93 large cities of the United States, as compared with 9,532 last week and a 3-year (1941–43) average of 9,342. The cumulative total to date is 122,809, as compared with 122,503 for the same period last year.

Telegraphic morbidity reports from State health officers for the week ended March 25, 1944, and comparison with corresponding week of 1943 and 5-year median

In these tables a zero indicates a definite report, while leaders imply that, although none was reported, cases may have occurred.

Division and State	Diphtheria			Influenza			Measles			Meningitis, meningococcus		
	Week ended		Median 1939–43	Week ended		Median 1939–43	Week ended		Median 1939–43	Week ended		Median 1939–43
	Mar. 25, 1944	Mar. 27, 1943		Mar. 25, 1944	Mar. 27, 1943		Mar. 25, 1944	Mar. 27, 1943		Mar. 25, 1944	Mar. 27, 1943	
NEW ENGLAND												
Maine	1	0	0	2	2	2	319	5	118	5	20	1
New Hampshire	0	0	0	----	1	1	10	29	29	0	1	0
Vermont	0	0	0	1	----	----	155	387	24	0	1	0
Massachusetts	3	1	1	----	----	----	782	1,706	929	11	30	4
Rhode Island	1	0	0	18	----	----	234	31	31	3	29	0
Connecticut	1	0	0	2	4	6	502	349	349	7	7	0
MIDDLE ATLANTIC												
New York	15	30	30	[1] 6	[1] 12	[1] 28	3,427	2,413	1,615	56	51	5
New Jersey	2	6	4	10	15	15	1,515	1,526	672	20	38	2
Pennsylvania	9	10	13	9	2	----	940	2,362	1,206	27	44	7
EAST NORTH CENTRAL												
Ohio	6	2	6	22	16	14	2,487	634	260	37	7	0
Indiana	3	4	11	7	23	38	315	262	155	9	9	1
Illinois	14	12	23	61	17	35	1,092	1,262	741	44	14	2
Michigan [2]	10	3	3	6	20	19	1,127	904	289	35	24	2
Wisconsin	5	6	1	85	44	184	2,316	1,260	886	8	3	1
WEST NORTH CENTRAL												
Minnesota	7	5	0	3	1	2	1,467	121	214	11	4	0
Iowa	1	1	3	----	----	9	239	393	198	1	0	0
Missouri	4	2	5	3	5	8	414	586	384	27	19	2
North Dakota	0	0	1	28	9	9	146	61	61	0	1	0
South Dakota	2	2	1	----	----	1	55	202	14	0	0	0
Nebraska	2	0	2	1	3	7	110	349	165	2	2	0
Kansas	5	12	6	4	11	12	863	760	628	7	5	0
SOUTH ATLANTIC												
Delaware	1	0	0	----	----	----	6	136	7	1	1	0
Maryland [3]	8	3	2	4	6	19	1,076	91	196	5	17	1
District of Columbia	0	0	2	3	1	2	153	91	88	2	6	1
Virginia	2	8	8	480	404	524	1,355	692	524	37	33	4
West Virginia	2	3	6	3	20	67	447	73	73	7	1	2
North Carolina	8	9	9	7	180	73	1,899	111	1,028	13	14	2
South Carolina	0	6	6	515	920	666	524	127	127	7	13	1
Georgia	5	5	8	51	79	141	428	298	216	11	7	2
Florida	2	1	2	5	14	14	385	65	171	15	3	1
EAST SOUTH CENTRAL												
Kentucky	2	3	4	82	14	38	89	752	137	5	13	4
Tennessee	3	3	3	74	96	117	218	401	118	33	9	1
Alabama	3	13	6	62	264	269	462	342	342	8	8	2
Mississippi [3]	2	1	3	----	----	----	----	----	----	6	23	1
WEST SOUTH CENTRAL												
Arkansas	5	4	6	105	114	187	202	96	96	5	4	1
Louisiana	6	2	8	60	10	10	334	197	120	6	14	2
Oklahoma	2	3	6	141	76	165	89	74	74	2	8	1
Texas	37	41	35	964	1,243	1,277	2,003	1,359	1,250	11	20	2
MOUNTAIN												
Montana	1	0	2	17	43	14	194	320	53	4	0	0
Idaho	0	0	0	----	5	----	50	101	92	0	2	0
Wyoming	2	0	1	20	40	3	114	191	71	0	1	0
Colorado	2	15	9	41	19	23	367	772	238	1	3	0
New Mexico	0	1	1	18	3	15	79	33	68	0	0	1
Arizona	3	0	0	106	138	173	357	53	53	0	0	0
Utah [3]	0	2	1	204	11	22	30	354	266	0	2	0
Nevada	0	0	0	0	----	0	1	50	10	0	0	0
PACIFIC												
Washington	1	2	1	34	6	6	212	686	668	6	8	1
Oregon	1	1	2	30	34	34	98	438	438	8	10	0
California	23	24	16	85	91	181	2,584	1,127	1,127	47	43	5
Total	212	246	272	3,379	4,016	4,438	32,271	24,632	24,415	550	572	52
12 weeks	3,002	3,437	3,814	317,797	53,969	100,056	272,325	184,225	183,027	6,637	5,231	638

See footnotes at end of table.

Telegraphic morbidity reports from State health officers for the week ended March 25, 1944, and comparison with corresponding week of 1943 and 5-year median—Con.

Division and State	Poliomyelitis			Scarlet fever			Smallpox			Typhoid and paratyphoid fever		
	Week ended		Median 1939–43	Week ended		Median 1939–43	Week ended		Median 1939–43	Week ended		Median 1939–43
	Mar. 25, 1944	Mar. 27, 1943		Mar. 25, 1944	Mar. 27, 1943		Mar. 25, 1944	Mar. 27, 1943		Mar. 25, 1944	Mar. 27, 1943	
NEW ENGLAND												
Maine	0	0	0	64	6	12	0	0	0	1	0	0
New Hampshire	0	0	0	13	22	4	0	0	0	0	0	0
Vermont	0	0	0	10	21	7	0	0	0	0	0	0
Massachusetts	0	2	0	443	606	194	0	0	0	0	0	0
Rhode Island	0	0	0	15	17	16	0	0	0	0	0	0
Connecticut	0	0	0	129	78	78	0	0	0	0	0	0
MIDDLE ATLANTIC												
New York	1	0	0	646	587	587	0	0	0	5	6	4
New Jersey	0	0	0	295	160	225	0	0	0	1	1	1
Pennsylvania	1	2	0	689	323	377	0	0	0	3	2	5
EAST NORTH CENTRAL												
Ohio	0	1	0	490	249	261	1	1	1	2	2	3
Indiana	0	0	0	244	76	182	1	4	4	3	4	3
Illinois	0	0	0	532	210	503	0	1	2	1	3	3
Michigan [3]	0	0	0	283	126	284	0	0	1	3	5	2
Wisconsin	0	1	0	461	294	148	1	0	0	0	2	0
WEST NORTH CENTRAL												
Minnesota	0	0	0	208	41	82	0	0	3	1	0	0
Iowa	0	0	0	168	67	69	0	0	4	0	0	1
Missouri	0	0	0	161	110	110	0	0	6	4	2	2
North Dakota	0	0	0	45	3	7	0	0	1	0	0	0
South Dakota	0	0	0	27	18	18	1	0	0	0	0	0
Nebraska	0	0	0	102	34	31	0	0	0	0	0	0
Kansas	1	0	0	106	96	96	0	0	0	3	0	1
SOUTH ATLANTIC												
Delaware	0	0	0	23	11	14	0	0	0	0	0	0
Maryland [3]	0	0	0	230	107	55	0	0	0	0	0	0
District of Columbia	0	0	0	155	20	20	0	0	0	0	0	0
Virginia	1	0	0	159	55	40	0	0	0	1	1	2
West Virginia	0	0	0	96	39	39	0	0	0	6	0	2
North Carolina	0	0	0	26	26	26	0	3	0	2	5	2
South Carolina	0	0	0	9	10	5	1	0	0	1	0	1
Georgia	0	1	1	21	14	14	0	0	0	3	1	3
Florida	0	1	1	15	4	8	0	0	0	5	1	2
EAST SOUTH CENTRAL												
Kentucky	0	0	0	63	55	90	0	2	1	3	0	1
Tennessee	1	0	0	64	40	47	1	0	1	0	1	1
Alabama	0	0	1	12	17	17	0	0	1	0	1	2
Mississippi [3]	0	0	0	22	16	6	0	1	0	1	1	3
WEST SOUTH CENTRAL												
Arkansas	0	0	1	15	16	6	0	1	2	2	2	2
Louisiana	1	0	0	13	10	10	0	0	0	10	6	3
Oklahoma	0	0	1	18	14	20	1	3	2	0	1	1
Texas	4	8	1	81	36	49	0	2	4	9	2	8
MOUNTAIN												
Montana	0	0	0	58	6	21	0	0	0	0	0	0
Idaho	0	0	0	37	3	5	0	0	0	0	0	0
Wyoming	0	0	0	17	57	9	0	0	0	0	0	1
Colorado	0	0	0	60	57	37	0	1	1	0	0	0
New Mexico	0	0	0	14	2	6	0	0	0	1	1	1
Arizona	0	0	0	15	25	8	0	0	0	0	2	0
Utah [3]	0	1	0	149	61	22	0	0	0	0	0	0
Nevada	0	0	0	1	1	0	0	0	0	0	0	0
PACIFIC												
Washington	1	0	0	361	42	45	1	0	1	1	0	1
Oregon	0	0	1	151	19	18	0	0	0	1	0	1
California	3	1	2	340	200	177	0	0	0	3	1	3
Total	14	18	24	7,356	4,107	4,269	8	19	36	76	53	82
12 weeks	277	320	311	69,087	46,702	48,344	152	319	882	892	638	916

See footnotes at end of table.

Telegraphic morbidity reports from State health officers for the week ended March 25, 1944, and comparison with corresponding week of 1943 and 5-year median—Con.

Division and State	Whooping cough			Week ended Mar. 25, 1944								
	Week ended		Median 1939–43	Anthrax	Dysentery			Encephalitis, infectious	Leprosy	Rocky Mt. spotted fever	Tularemia	Typhus fever
	Mar. 25, 1944	Mar. 27, 1943			Amebic	Bacillary	Unspecified					
NEW ENGLAND												
Maine	13	37	43	0	0	0	0	0	0	0	0	0
New Hampshire	1	3	3	0	0	0	0	0	0	0	0	0
Vermont	45	16	32	0	0	0	0	0	0	0	0	0
Massachusetts	97	232	232	0	0	0	0	0	0	0	0	0
Rhode Island	9	50	49	0	0	0	0	0	0	0	0	0
Connecticut	27	57	59	0	0	0	0	0	0	0	0	0
MIDDLE ATLANTIC												
New York	130	368	382	0	1	5	0	4	0	0	0	1
New Jersey	45	227	227	0	4	0	0	1	0	0	0	0
Pennsylvania	100	321	292	0	10	0	0	0	0	0	0	0
EAST NORTH CENTRAL												
Ohio	75	167	167	1	0	0	0	0	0	0	0	0
Indiana	5	34	41	0	0	0	0	0	0	0	0	0
Illinois	45	138	138	0	0	1	0	1	0	0	0	0
Michigan [2]	43	233	199	0	0	1	0	0	0	0	0	0
Wisconsin	69	192	146	0	0	0	0	0	0	0	0	0
WEST NORTH CENTRAL												
Minnesota	21	76	43	0	2	0	0	0	0	0	0	0
Iowa	11	27	19	0	0	0	0	0	0	0	0	0
Missouri	12	30	27	0	0	0	0	0	0	0	0	0
North Dakota	2	17	9	0	0	0	0	0	0	0	0	0
South Dakota	1	0	2	0	0	0	0	0	0	0	0	0
Nebraska	31	10	10	0	0	0	0	0	0	0	0	0
Kansas	30	65	39	0	0	0	0	0	0	0	1	0
SOUTH ATLANTIC												
Delaware	0	11	11	0	0	0	0	0	0	0	0	0
Maryland [2]	36	91	91	0	0	0	0	1	0	0	0	0
District of Columbia	2	33	19	0	0	0	0	0	0	0	0	0
Virginia	74	48	48	0	0	0	31	0	0	0	3	1
West Virginia	11	16	27	0	0	0	0	0	0	0	0	0
North Carolina	170	151	152	0	0	0	0	0	0	0	0	0
South Carolina	75	52	57	0	0	8	0	0	0	0	0	0
Georgia	10	33	29	0	0	0	0	0	0	0	3	5
Florida	27	14	20	0	2	0	0	0	0	0	0	3
EAST SOUTH CENTRAL												
Kentucky	68	31	53	0	0	0	0	0	0	0	0	0
Tennessee	10	125	29	0	0	0	3	0	0	0	2	0
Alabama	25	43	40	0	1	0	0	0	0	0	0	1
Mississippi [2]				0	0	0			0	0	2	2
WEST SOUTH CENTRAL												
Arkansas	4	46	20	0	3	0	0	0	0	0	0	0
Louisiana	0	4	7	0	0	4	0	0	1	0	1	0
Oklahoma	10	27	22	0	0	0	0	1	0	0	0	0
Texas	189	451	255	0	9	136	0	0	0	0	0	10
MOUNTAIN												
Montana	9	8	5	0	0	0	0	0	0	0	0	0
Idaho	0	0	9	0	0	0	0	0	0	0	0	0
Wyoming	7	1	1	0	0	0	0	0	0	0	0	0
Colorado	38	20	20	0	0	0	0	0	0	0	0	0
New Mexico	1	8	12	0	0	1	0	1	0	0	0	0
Arizona	31	19	27	0	0	0	11	0	0	0	0	0
Utah [2]	39	46	46	0	0	0	0	0	0	0	0	0
Nevada	0	1	0	0	0	0	0	0	0	0	0	0
PACIFIC												
Washington	63	27	72	0	0	0	0	0	0	0	0	0
Oregon	14	12	18	0	0	0	0	0	0	0	0	0
California	101	435	319	0	9	12	0	2	0	0	0	1
Total	1,826	4,053	4,053	1	41	168	45	11	1	0	12	24
12 weeks	22,109	47,025	47,291	11	317	2,352	745	126	8	2	125	475

[1] New York City only.
[2] Period ended earlier than Saturday.

WEEKLY REPORTS FROM CITIES

City reports for week ended March 11, 1944

This table lists the reports from 87 cities of more than 10,000 population distributed throughout the United States, and represents a cross section of the current urban incidence of the diseases included in the table.

	Diphtheria cases	Encephalitis, infectious, cases	Influenza		Measles cases	Meningitis, meningococcus, cases	Pneumonia deaths	Poliomyelitis cases	Scarlet fever cases	Smallpox cases	Typhoid and paratyphoid fever cases	Whooping cough cases
			Cases	Deaths								
NEW ENGLAND												
Maine:												
Portland	0	0	------	0	21	0	5	0	9	0	0	1
New Hampshire:												
Concord	0	0	------	0	0	0	1	0	2	0	0	0
Vermont:												
Barre	0	0	------	0	0	0	0	0	0	0	0	0
Massachusetts:												
Boston	2	0	------	0	56	9	14	0	77	0	1	15
Fall River	0	0	------	2	11	1	1	0	9	0	0	0
Springfield	0	0	------	0	43	0	0	0	36	0	0	12
Worcester	0	0	------	0	2	1	7	0	94	0	0	4
Rhode Island:												
Providence	0	1	------	0	216	1	6	0	6	0	0	1
Connecticut:												
Bridgeport	0	0	------	0	35	0	0	0	6	0	0	0
Hartford	0	0	------	0	3	1	1	0	23	0	1	0
New Haven	0	0	------	0	107	1	1	0	3	0	0	2
MIDDLE ATLANTIC												
New York:												
Buffalo	0	0	------	1	4	1	2	0	18	0	0	2
New York	12	1	9	2	1,800	37	80	2	379	0	1	29
Rochester	0	0	------	0	4	6	1	0	0	0	0	3
Syracuse	0	0	------	0	4	0	3	0	11	0	0	14
New Jersey:												
Camden	0	0	------	0	6	0	2	0	49	0	0	0
Newark	0	0	3	1	75	6	4	0	21	0	0	1
Trenton	0	0	2	0	10	2	2	0	11	0	0	0
Pennsylvania:												
Philadelphia	1	0	3	1	23	8	42	0	100	0	1	17
Pittsburgh	0	0	4	5	131	3	19	1	27	0	1	6
Reading	0	0	------	0	5	0	3	0	5	0	0	1
EAST NORTH CENTRAL												
Ohio:												
Cincinnati	1	0	------	1	55	3	6	0	38	0	0	2
Cleveland	0	0	3	3	831	5	10	0	82	0	0	12
Columbus	0	0	3	3	163	1	7	0	11	0	0	11
Indiana:												
Fort Wayne	0	0	------	0	9	0	1	0	4	0	1	1
Indianapolis	1	0	------	1	34	6	9	0	60	0	0	4
South Bend	0	0	------	0	4	0	0	0	5	0	0	0
Terre Haute	0	0	------	0	0	0	2	0	0	0	0	0
Illinois:												
Chicago	1	0	3	1	78	17	22	0	200	0	0	18
Springfield	0	0	------	0	96	0	2	0	2	0	0	2
Michigan:												
Detroit	5	0	4	2	100	14	26	0	86	0	1	7
Flint	0	0	------	0	28	0	0	0	4	0	0	6
Grand Rapids	0	0	------	0	286	0	0	0	6	0	0	1
Wisconsin:												
Kenosha	0	0	------	0	2	0	0	0	3	0	0	5
Milwaukee	1	0	------	0	76	4	5	0	63	0	0	14
Racine	0	0	------	1	4	0	1	0	6	0	0	6
Superior	0	0	------	0	4	0	0	1	18	0	0	0
WEST NORTH CENTRAL												
Minnesota:												
Duluth	0	0	------	0	19	0	3	0	16	0	0	4
Minneapolis	3	0	------	0	681	4	6	0	41	0	0	1
St. Paul	0	0	------	0	696	1	9	0	43	0	0	1

City reports for week ended March 11, 1944—Continued

	Diphtheria cases	Encephalitis, infectious, cases	Influenza		Measles cases	Meningitis, meningococcus, cases	Pneumonia deaths	Poliomyelitis cases	Scarlet fever cases	Smallpox cases	Typhoid and paratyphoid fever cases	Whooping cough cases
			Cases	Deaths								
WEST NORTH CENTRAL—continued												
Missouri:												
Kansas City	0	0	------	0	31	2	8	0	43	0	0	1
St. Joseph	0	0	------	0	0	0	0	0	4	0	0	0
St. Louis	0	0	5	1	287	13	13	0	31	0	0	3
North Dakota:												
Fargo	0	0	------	0	9	0	0	0	12	0	0	0
Nebraska:												
Omaha	3	0	------	0	22	1	4	0	40	0	0	0
Kansas:												
Topeka	0	0	------	0	41	0	3	0	1	0	0	2
Wichita	0	0	------	0	119	0	1	0	0	0	0	0
SOUTH ATLANTIC												
Delaware:												
Wilmington	0	0	------	0	3	0	6	0	0	0	0	1
Maryland:												
Baltimore	3	0	2	1	888	5	27	0	88	0	0	21
Cumberland	0	0	------	0	0	0	0	0	2	0	0	0
Frederick	0	0	------	0	1	0	0	0	1	0	0	0
District of Columbia:												
Washington	1	0	11	2	150	4	14	0	230	0	0	3
Virginia:												
Lynchburg	0	0	17	0	6	0	1	0	0	0	0	0
Richmond	0	0	2	0	283	2	6	0	12	0	0	0
Roanoke	0	0	------	0	68	0	3	0	0	0	0	2
West Virginia:												
Charleston	0	0	------	0	1	1	0	0	10	0	0	0
Wheeling	0	0	------	0	4	0	3	0	12	0	0	0
North Carolina:												
Winston-Salem	0	0	------	0	39	0	4	0	2	0	0	0
South Carolina:												
Charleston	0	0	5	0	19	2	0	0	2	0	0	1
Georgia:												
Atlanta	1	0	10	2	25	1	3	0	6	0	0	0
Brunswick	0	0	------	0	18	0	3	0	0	0	0	0
Savannah	0	0	4	2	11	1	1	0	1	0	0	0
Florida:												
Tampa	0	0	4	0	8	2	1	0	1	0	0	2
EAST SOUTH CENTRAL												
Tennessee:												
Memphis	0	0	5	0	14	9	6	0	12	0	0	0
Nashville	0	0	------	1	8	2	6	0	5	0	0	0
Alabama:												
Birmingham	0	0	1	1	27	0	5	0	1	0	0	3
Mobile	0	0	------	2	17	5	3	0	0	0	0	0
WEST SOUTH CENTRAL												
Arkansas:												
Little Rock	0	0	6	0	24	0	2	0	1	0	0	1
Louisiana:												
New Orleans	0	1	9	1	41	1	2	0	8	0	0	2
Shreveport	0	0	------	0	0	0	7	0	1	0	0	0
Texas:												
Dallas	2	0	------	0	113	0	8	0	4	0	0	0
Houston	3	0	------	0	43	0	6	0	1	0	0	0
San Antonio	5	0	4	1	17	2	5	1	1	0	0	0
MOUNTAIN												
Montana:												
Billings	0	0	------	0	11	0	0	0	3	0	0	0
Great Falls	0	0	------	0	17	0	3	0	10	0	0	0
Helena	0	0	------	0	0	0	0	0	3	0	0	0
Missoula	0	0	------	0	6	0	2	0	3	0	0	0
Idaho:												
Boise	0	0	------	0	10	0	0	0	17	0	0	0
Colorado:												
Denver	1	0	6	0	118	1	5	0	20	0	0	19
Pueblo	0	0	------	0	17	0	0	0	3	0	0	2
Utah:												
Salt Lake City	0	0	------	1	6	0	3	0	23	0	0	1

City reports for week ended March 11, 1944—Continued

	Diphtheria cases	Encephalitis, infectious, cases	Influenza		Measles cases	Meningitis, meningococcus, cases	Pneumonia deaths	Poliomyelitis cases	Scarlet fever cases	Smallpox cases	Typhoid and paratyphoid fever cases	Whooping cough cases
			Cases	Deaths								
PACIFIC												
Washington:												
Seattle	0	0	-----	2	38	0	4	0	42	0	0	7
Spokane	0	0	2	2	54	0	1	0	24	0	0	4
Tacoma	1	0	-----	0	10	0	0	0	70	0	0	2
California:												
Los Angeles	4	0	23	2	179	7	11	0	33	0	0	10
Sacramento	0	0	-----	0	11	0	4	0	2	0	0	7
San Francisco	0	0	13	3	88	6	10	2	93	0	0	18
Total	51	3	163	48	8,624	199	497	7	2,461	0	7	315
Corresponding week, 1943	47	3	331	43	5,499	168	530	536	1,525	1	7	1,059
Average, 1939–43	82	-----	538	[1] 54	[2] 4,623	-----	[1] 519	-----	1,566	10	18	1,078

[1] 3-year average, 1941–43.
[2] 5-year median.

Dysentery, amebic—Cases: Boston, 2; New York, 1; Philadelphia, 3; St. Louis, 1; Billings, 1; San Francisco, 1.
Dysentery, bacillary—Cases: New York, 1; Nashville, 1; Los Angeles, 5; Charleston, S. C., 11.
Dysentery, unspecified—Cases: San Antonio, 2.
Leprosy—Cases: Tampa, 1.
Typhus fever—Cases: Nashville, 1; New Orleans, 1.

Rates (annual basis) per 100,000 population, by geographic groups, for the 87 cities in the preceding table (estimated population, 1942, 34,614,400)

	Diphtheria case rates	Encephalitis, infectious, case rates	Influenza		Measles case rates	Meningitis, meningococcus, case rates	Pneumonia death rates	Poliomyelitis case rates	Scarlet fever case rates	Smallpox case rates	Typhoid and paratyphoid fever case rates	Whooping cough case rates
			Case rates	Death rates								
New England	5.0	2.5	0.0	5.0	1,231	34.9	89.7	0.0	660	0.0	5.0	87
Middle Atlantic	5.8	0.4	9.4	4.5	922	28.2	70.7	1.3	278	0.0	1.3	33
East North Central	5.3	0.0	7.6	7.0	1,036	29.3	53.3	0.6	344	0.0	1.2	52
West North Central	11.8	0.0	9.8	2.0	3,733	41.2	92.1	0.0	453	0.0	0.0	24
South Atlantic	8.7	0.0	95.7	12.2	2,652	31.3	125.3	0.0	654	0.0	0.0	52
East South Central	0.0	0.0	35.7	23.8	393	95.3	119.1	0.0	107	0.0	0.0	18
West South Central	30.5	3.1	58.0	6.1	727	9.2	91.6	3.1	49	0.0	0.0	9
Mountain	8.1	0.0	48.4	8.1	1,491	8.1	104.8	0.0	661	0.0	0.0	177
Pacific	8.8	0.0	66.6	15.8	666	22.8	52.6	3.5	463	0.0	0.0	84
Total	7.7	0.5	24.6	7.3	1,303	30.1	75.1	1.2	372	0.0	1.1	48

TERRITORIES AND POSSESSIONS

Hawaii Territory

Honolulu—Dengue fever.—During the period February 16–29, 1944, 18 cases of dengue fever were reported in Honolulu, T. H., bringing the total number reported to date to 1,434. The number of cases reported during this period is approximately half the number of cases reported for the first half of February, but higher than the number of cases reported for the last half of January.

FOREIGN REPORTS

ANGOLA

Notifiable diseases—October–December 1943.—During the months of October, November, and December 1943 certain notifiable diseases were reported in Angola as follows:

Disease	October		November		December	
	Cases	Deaths	Cases	Deaths	Cases	Deaths
Beriberi	7		6		5	
Cerebrospinal meningitis	2	1	1	1	1	
Chickenpox	112		58		55	
Diphtheria			4		1	
Dysentery (amebic)	182	7	229	20	127	8
Dysentery (bacillary)	5		1		3	
Gonorrhea	263		238		408	
Grippe	834	19	690	17	853	21
Hookworm disease	523	7	528	13	374	
Leprosy	16		7		2	
Measles	95	1	100	1	63	
Mumps	4		23		10	
Pneumonia	156	24	165	11	173	17
Poliomyelitis	2		3		2	
Rabies			1	1		
Relapsing fever	16		17		25	
Sleeping sickness	189	14	253	18	154	4
Smallpox	18		4		17	
Syphilis	426		432		458	
Tetanus	7	1	6	1	7	2
Tuberculosis (respiratory)	28	4	51	10	40	4
Typhoid and paratyphoid fever	8	1	18	1	11	1
Whooping cough	233	3	219	5	202	
Yaws	871		735		811	

CANADA

Provinces—Communicable diseases—Week ended February 26, 1944.—During the week ended February 26, 1944, cases of certain communicable diseases were reported by the Dominion Bureau of Statistics of Canada as follows:

Disease	Prince Edward Island	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	British Columbia	Total
Chickenpox	1	5	1	191	405	71	47	134	176	1,031
Diphtheria	5	6	1	20	5	6				43
German measles		1		32	47	28	19	7	9	143
Influenza		22			35	1	4		19	81
Measles	1	36	1	845	679	78	51	222	11	1,924
Meningitis, meningococcus		1		1	3	1	1		2	9
Mumps	3	11		53	250	98	19	35	21	490
Scarlet fever		16	1	66	230	71	10	75	64	533
Tuberculosis (all forms)		8	5	142	36	24	2	24	134	375
Typhoid and paratyphoid fever			1	31		1	1			34
Undulant fever				2	2	1			2	7
Whooping cough		16		89	90	12	6	4	29	246

CUBA

Habana—Communicable diseases—4 weeks ended March 4, 1944.—During the 4 weeks ended March 4, 1944, certain communicable diseases were reported in Habana, Cuba, as follows:

Disease	Cases	Deaths	Disease	Cases	Deaths
Diphtheria	35	1	Scarlet fever	1	
Malaria	6		Tuberculosis	6	1
Measles	42	4	Typhoid fever	32	3

SWITZERLAND

Notifiable diseases—July–September 1943.—During the months of July, August, and September 1943, cases of certain notifiable diseases were reported in Switzerland as follows:

Disease	July	August	September	Disease	July	August	September
Cerebrospinal meningitis	10	7	8	Mumps	146	75	95
Chickenpox	283	123	113	Paratyphoid fever	9	7	23
Diphtheria	133	140	331	Poliomyelitis	18	32	21
Dysentery	230	184	340	Scarlet fever	96	188	328
German measles	46	13	6	Tuberculosis	380	335	392
Hepatitis, epidemic	698	925	1,247	Typhoid fever	17	13	20
Influenza	10	4	31	Typhus fever			1
Lethargic encephalitis		1		Undulant fever	11	14	12
Malaria	2			Whooping cough	661	711	813
Measles	467	267	247				

WORLD DISTRIBUTION OF CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER

From medical officers of the Public Health Service, American consuls, International Office of Public Health, Pan American Sanitary Bureau, health section of the League of Nations, and other sources. The reports contained in the following tables must not be considered as complete or final as regards either the list of countries included or the figures for the particular countries for which reports are given.

CHOLERA

[C indicates cases]

NOTE.—Since many of the figures in the following tables are from weekly reports, the accumulated totals are for approximate dates.

Place		January–December 1943	January 1944	February 1944—week ended—			
				5	12	19	26
ASIA							
Ceylon	C	50		2			
China: Kwangsi Province	C	[1] 1,100					
India	C	323,270	23,274	2,715			
Bombay	C	28					
Calcutta	C	7,007	206	44	32	54	
Chittagong	C	391	6	2			
Cochin	C	192					
Madras	C	1,219	30	3			
Negapatam	C	21	12	3			
Vizagapatam	C	68					
India (French)	C	55					
Chandernagor	C	8					
Karikal	C	30					
Pondichery	C	17					

[1] Cases reported up to Sept. 8, 1943, with a mortality rate of over 25 percent.

PLAGUE

[C indicates cases; D, deaths; P, present]

Place		January–December 1943	January 1944	February 1944—week ended— 5	12	19	26
AFRICA							
Basutoland	C	[1] 23					
Belgian Congo	C	[2] 32	3				
Plague-infected rats		P					
British East Africa:							
Kenya	C	18					
Uganda	C	20					
Egypt	C	163	84	14			
Port Said	C	10	1				
Suez	C	[3] 18	82	12	5	6	3
French West Africa: Dakar	C	32					
Madagascar	C	234					
Morocco (French)	C	299	13				
Rhodesia, northern	C		1				
Senegal	C	251					
Union of South Africa	C	85	10	3			
ASIA							
India	C	8,643	1,451	375			
Indochina	C	31					
Palestine	C	13					
EUROPE							
Portugal (Azores)	C	[3] 56					
SOUTH AMERICA							
Ecuador: Loja Province	C	15					
Peru:							
Ancash Department	C	2					
Ica Department	C	2					
Lambayeque Department	C	2					
Libertad Department	C	26					
Lima Department	C	23					
Lima	C	1					
Plague-infected rats		P					
Piura Department	C	11					
Venezuela: Aragua and Miranda States	C	10					
OCEANIA							
Hawaii Territory:							
Hamakua District	D	7	[4] 2		1		
Plague-infected rats		[5] 93	[6] 8	3	1	[7] 6	

[1] Includes 12 cases of pneumonic plague in a village south of Mafeteng.
[2] Includes 7 cases of pneumonic plague.
[3] Approximated.
[4] Includes 1 death from pneumonic plague.
[5] Includes 4 plague-infected mice.
[6] Includes 3 plague-infected mice.
[7] Includes 1 plague-infected mouse.

SMALLPOX

[C indicates cases; D, deaths; P, present]

Place		January–December 1943	January 1944	February 1944—week ended—			
				5	12	19	26
AFRICA							
Algeria	C	1,741	93			[1] 111	
Angola	C	652					
Basutoland	C	146					
Belgian Congo	C	4,643	332	54	48		43
British East Africa:							
Kenya	C	3,439	776	153	150		
Mombasa	C	72	18	[2] 12	7		
Tanganyika	C	143	61				
Uganda	C	132	135	50			
Dahomey	C	156	7				
Egypt	C	4,161	592	288	277		
French Equatorial Africa	C	173	60				
French Guinea	C	378	1				
French West Africa: Dakar	C	4	1				
Gold Coast	C	25					
Ivory Coast	C	160	39				
Mauritania	C	40					
Morocco (French)	C	1,170	285				
Morocco (Spanish)	C	1	3				
Mozambique	C	1					
Nigeria	C	6,132	474	108	96		
Niger Territory	C	308	232				
Rhodesia, northern	C	123					
Senegal	C	111	2				
Sierra Leone	C	3					
Sudan (French)	C	3,795	445				
Tunisia	C	4	2				
Union of South Africa	C	788	3	1	2	6	
ASIA							
Arabia	C	3	4	[2] 2		1	
Ceylon	C	85	2				
India	C	53,577	25,952	8,212			
India (French)	C	10					
Indochina	C	5,113	344				
Iran	C	631					
Iraq	C	272	27	2	19	27	
Palestine	C	104				1	
Syria and Lebanon	C	1,132	39	10	2		
Trans-Jordan	C	19					
EUROPE							
Belgium	C	1					
France	C	2					
Germany	C	1					
Gibraltar	C	1				P	
Great Britain: London.[3]							
Greece	C	852					
Portugal	C	51	4	1	3		
Scotland	C	[4] 2					
Spain	C	222	2				
Switzerland	C	17					
Turkey	C	12,400					
NORTH AMERICA							
British Honduras	C	1					
Canada	C	6					
Guatemala	C	27					
Honduras	C	2					
Mexico	C	336	30	9	14	11	17
SOUTH AMERICA							
Brazil	C	58	1			1	
British Guiana	C	1					
Colombia	C	391	11	7	7		
Ecuador	C	25					
Peru	D	12	14				
Lima	C		14				
Venezuela	C	106	3				

[1] For 3 weeks.
[2] Imported.
[3] During the week ended March 11, 1944, 7 cases of smallpox with 2 deaths, including 1 imported case from the Middle East, were reported in London, Great Britain.
[4] Includes 1 case on a vessel from North Africa.

TYPHUS FEVER

[C indicates cases; D, deaths]

Place		January–December 1943	January 1944	February 1944—week ended— 5	12	19	26
AFRICA							
Algeria	C	8,321	80			[1] 81	
Basutoland	C	28					
Belgian Congo	C	39		1	2		1
British East Africa:							
Kenya	C	4	1		2		
Mombasa	C	1					
Uganda	C	1					
Egypt	C	40,084	932	526			
French Equatorial Africa	C	3					
French Guinea	C	1					
French West Africa: Dakar	C	32			1		
Gold Coast	C	9					
Morocco (French)	C	16,191	143				
Morocco (Spanish)	C	401					
Mozambique	C	1	1				
Nigeria	C	11					
Rhodesia, northern	C	14	5				
Senegal	C	2					
Sierra Leone	C	3					
Tunisia	C	356	53			[1] 75	
Union of South Africa	C	4,402	6			1	
ASIA							
Afghanistan	C	520					
Arabia: Western Aden Protectorate	C		14	1			
China: Shanghai	C	12					
India	C	1,066					
Iran	C	[2] 12,885	[2] 450				
Iraq	C	1,423	7			1	1
Palestine	C	340	12	18	15	19	27
Syria and Lebanon	C	95	3	6	14		
Trans-Jordan	C	17					
EUROPE							
Bulgaria	C	1,843	80				
France—Seine Department	C	2					
Germany	C	[3] 973					
Greece	C	99					
Hungary	C	1,012	160	107		[4] 121	54
Irish Free State	C	20					
Netherlands	C	3	7				
Portugal	C	11					
Rumania	C	8,441	1,153				[5] 2,256
Slovakia	C	637	100				
Spain	C	640	15				
Switzerland	C	1					
Turkey	C	4,234					
NORTH AMERICA							
Cuba	C	1					
Guatemala	C	1,334	155				
Jamaica	C	33					
Mexico	C	1,034	40				
SOUTH AMERICA							
Brazil	C	1					
Chile	C	245	12		2	4	
Colombia	D	2					
Curacao	C		1				
Ecuador	C	350					
Peru	C	17	1				
Venezuela	C	25	3				
OCEANIA							
Australia	C	123	11	2	4		6
Hawaii Territory	C	69	7	2	1	2	4

[1] For 3 weeks.
[2] Approximated on account of overlapping of dates.
[3] For the period Jan. 1 to Apr. 30, 1943.
[4] For 2 weeks.
[5] For the month of February 1944.

YELLOW FEVER

[C indicates cases; D, deaths]

Place		January-December 1943	January 1944	February 1944—week ended—			
				5	12	19	26
AFRICA							
Belgian Congo:							
Bondo	D	3					
Kinzao	D	1					
Leopoldville	C	2					
Stanleyville	D	1					
Yanonge	C	1					
British East Africa: Kenya—Kisumu	C	1					
Dahomey:							
Djougou District	C	[1] 2					
Natitingou	C	[1] 1					
French Guinea:							
Baccoro	C	1					
Dubreka	C	2					
Friguiagbe	C	1					
Matakang Island	D	1					
Gold Coast:							
Asuboi	C	1					
Komenda	C	1					
Tamale	C		[1] 1				
Ivory Coast:							
Abidjan	C	3					
Aboisso	C	[1] 1					
Bonoua	C	1					
Soubre	C	1					
Toumodi	D	[1] 1					
Portuguese Guinea	C	3					
Senegal:							
Goudiri	D	1					
Kolda	C	1					
Tambacounda	C	2					
Velingara Casamance	C	1					
Sierra Leone: Galinas	C	[1] 1					
EUROPE							
Portugal: Lisbon.[2]							
SOUTH AMERICA							
Brazil:							
Amazonas State	D	1					
Matto Grosso State	D		3				
Para State	D	1					
Colombia:							
Boyaca Department	D	14					
Cundinamarca Department	D	7					
Intendencia of Meta	D	9					
Santander Department	D	1					

[1] Suspected.

[2] According to information dated January 21, 1944, it is reported that a vessel which called at the islands of Sao Tome and Cape Verde arrived at Lisbon, Portugal, with cases of yellow fever on board.

COURT DECISION ON PUBLIC HEALTH

Anthrosilicosis—recovery of damages denied.—(Pennsylvania Supreme Court; *Prattico* v. *Hudson Coal Co.*, 32 A.2d 733; decided June 30, 1943.) The plaintiff sought to recover damages for the occupational disease of anthrosilicosis. The jury disagreed and was discharged and the defendant company moved for judgment on the whole record. The lower court dismissed this motion and ordered a retrial and the defendant appealed to the Supreme Court of Pennsylvania. The appellate court said that the fundamental question was whether a plaintiff, who admitted that he knew coal mining "must make dust," had made out a case for the jury by showing merely that

he had contracted silicosis after working for 8 years in the "face" of coal mine chambers where the air became so dust laden that "intermittently—at times" visibility to see another person was only 3 feet. The plaintiff's contention was that this question had to be answered in the affirmative, taking the view that "by common law and by statute * * * the defendant had a duty to insure the plaintiff a safe place to work" and that "the plaintiff's admitted physical condition is a conclusive answer that he was not furnished a safe place to work."

The supreme court reviewed the applicable statute, the anthracite mining act, but found that nowhere in the act was there any provision imposing on mine owners an absolute duty to eliminate or sweep away the dust incident to mine operations. There was no mention of dust except in one part relating solely to the removal of dust from coal breakers. Nor, according to the court, could such duty be held to arise by implication from language in the act relative to rendering harmless smoke and noxious gases and requiring the use of every precaution to insure the safety of the workmen. The act did provide for not less than 200 cubic feet of air per minute for each employee and violations of this section by the defendant were alleged but not proved. The defendant's official records, which were unimpeached by the plaintiff, conclusively established that the defendant provided a constant and adequate supply of pure air as provided in the mining act.

Although there was no statutory duty, the supreme court stated that it did not mean to say that no duty whatever rested upon the defendant concerning the elimination or amelioration of dust in its mine. The test of liability was the failure to furnish a safe place to work as measured by the standards imposed by the common law. The common law doctrine had been stated in a prior case from which the court quoted as follows: "The employer is bound to furnish machinery and appliances reasonably safe for the use intended. Reasonable safety within the meaning of the law means that the machinery and appliances furnished must be of the usual and ordinary kind adopted by those in the same kind of business. An employer is not even bound to provide the safest machinery or the newest and most approved appliances. He has performed his duty in this respect when he furnishes those of the ordinary character in general use in the business in which he is engaged." It was pointed out that the test of liability was not danger but negligence and that negligence was never imputed from the employment of methods or machinery in general use in the business. In the instant case the only evidence on the subject was that the methods and equipment of defendant were of the usual and ordinary character in general use throughout the

U.S. 46 P4r SOCIAL SCIENCES

anthracite mining industry. The court concluded that there was, therefore, no question of breach of defendant's duty to furnish a reasonably safe place to work to submit to the jury, as no such breach had been shown. To make out a prima facie case, said the court, the burden rested with plaintiff to produce evidence which, if believed, would warrant a finding that his injury resulted from a failure of defendant to perform a duty imposed by statute or by the general usages of the mining industry. The plaintiff did not meet this burden and hence the defendant was entitled to judgment on the whole record.